Indian Journal of Economics & Business, Vol. 18, No.2 (2019) : 467-486

ANALYSIS OF INSTITUTIONAL DETERMINANTS IMPACTING FDI INFLOWS IN INDIA AND CHINA USING PANEL DATA REGRESSION MODELLING

DR. PRIYA GUPTA

Abstract: *Both the developed and developing countries seek to attract FDI due to the several advantages that it brings in an economy for the overall economic development.*

Various studies in the past have been conducted to find out the economic determinants affecting the FDI inflows but not much has been explored on the qualitative front. Moreover, the focus of such studies has been majorly on the developed countries. Therefore, this paper tries to determine whether institutional quality has any significant impact on the FDI inflows in the specific context of the two most emerging economies of the world, that is, India and China using panel data regression modelling.

Under this technique, all the three regression models, that is, common constant (ordinary least square [OLS]), fixed effects, and random effects are tested to explore the institutional determinants of FDI inflows. The empirical results of the modified random effect model reveal that Corruption and Gender Parity Index are the two most significant institutional determinants impacting the FDI inflows in both India and China commonly.

Keywords: *Foreign Direct Investment; Institutional Determinants; Qualitative, Determinants; Panel Data Regression; Gender Parity Index; Corruption; FDI; India; China; FDI Inflows; Fixed & Random Effect*

INTRODUCTION

Foreign Direct Investment (FDI) has been strongly affecting the world economy in the past years. The Indian Government is also opening up gradually in its trade policies like it provides tax and non-tax incentives to foreign investors in specific sectors like electronics. It is also promoting its regional development by inviting foreign investors in the North- eastern regions, Himachal Pradesh and Uttarakhand. For the upliftment of the exporters in the economy and reducing the trade deficits, the Government also provides incentives for MNCs to set up their units in Special Economic Zones (SEZ), National Investment & Manufacturing Zones

Assistant Professor (Sr.), Lal Bahadur Shastri Institute of Management, Sector- 11, Dwarka, New Delhi- 110075, E-mail Id: priyagupta.1704@gmail.com

(NIMZ) and Export Processing Zones (EPZ). Along with these measures, the state governments in India are also allowed to provide additional investment incentives, which may include providing land at subsidized prices, giving soft loans to manufacturers, cheap availability of power, tax holidays, etc. The role of financial institutions in the Indian economy is also huge in promoting a culture of investment where central government development banks and state industrial development banks offer medium to long term loans for new projects at relatively lower interest rates.

Some more relaxations have been provided by the Government in its FDI policy like raising the foreign investment limit, lesser restrictions on modes of investment (i.e. putting many sectors on the 'automatic route' as opposed to the 'Government route', which required prior approval from the Foreign Investment Promotion Board (FIPB)). More investment in sectors like real estate, private banking, defense, civil aviation, single brand retail and news broadcasting is likely to be seen with such relaxations been granted by the Government. Moreover, foreign firms are now also allowed to invest in creating railway networks and supplying bullet trains. Newer policies of the present Government like Make in India, Digital India, and Skill India etc. are also some positive moves in promoting FDI.

Earlier findings suggest that probably the restrictive FDI policies of the Indian Government were a major reason for restraining the foreign players to enter into the Indian market and operate freely. However, it is also to be noted that with the newly elected Central Government in India since 2014, more liberalized trade policies and campaigns like Make in India have induced more foreign participants to invest in India. This is also reflected in the increased levels of FDI inflows from 2014- 2016. The highest levels of FDI inflows were achieved by India in year 2016 only, i.e. 44.46 billion USD.

Our neighbouring country China is among the top most countries in the world for attracting FDI inflows which is due to its economic growth measured in terms of GDP growth rate, high capital formation rate, high industrial production index among many others. Therefore, it is equally relevant to discuss its success story in terms of its qualitative factors contributing to increased FDI inflows and higher foreign participation vis-à-vis India.

The Government of China has a very clear policy of investment in which it has segregated the sectors where it wants to promote FDI and where it is prohibited. The sectors which are in need of FDI as per the Government are: advance technology, innovative equipment manufacturing, services sector, recycling of waste, clean and green production technologies, the use of renewable energies and environmental protection. On the other hand, those sectors which already have a relatively strong production capacity and are in use of advanced technologies are prohibited for FDI.

In addition to the above policy, the Government of China also discourages foreign investment in sectors which are deemed to be keys for social stability, sectors where domestic firms are to be developed into globally competitive MNCs and sectors which are running wholly by the support of sanctions by the Government. The Government also prohibits investments in currency market and real estate where the intention of foreign investor is to make quick gains and indulge into speculative activities. Moreover, the Government has also strictly indicated that it plans to restrict FDI in resource intensive and highly pollution emitting industries.

While lot of literature is available on the studies related to determinants of FDI inflows, most of them focus on either the analysis of a single country or are based on conceptual frameworks formulated to analyze FDI inflows in developed countries of the world. However, nothing much has been discussed whether the logic postulated in previous studies can be directly applied to FDI inflows in emerging economies like India and China. Therefore, this study adds not just to the literature of FDI but also has significant implications for the policy makers and researchers dwelling upon this area.

AN OVERVIEW OF FDI INFLOWS IN INDIA AND CHINA

Many comparisons have been made between India and China, probably because of the same challenges that the two countries have faced. In recent times FDI and economic growth have been common topics of discussion with respect to the two most emerging economies of the world. Both these economies have adopted market oriented policies for attracting inward FDI. These economies are becoming integrated with the global economies through open international trade and capital flows.

The table below shows the annual FDI inflows in India and China in US billion dollars from 2007-2017.

Table 1: Annual FDI net inflows in India and China (2007- 2017, in US billion $)

Year	India	China
2017	39.9661	168.2236
2016	44.4586	174.7496
2015	44.0095	242.4893
2014	34.5766	268.0972
2013	28.1530	290.9284
2012	23.9957	241.2139
2011	36.4987	280.0722
2010	27.3969	243.7034
2009	35.5814	131.0571

2008	43.4063	171.5347
2007	25.2277	156.2493

Note: Own compilation based on the data extracted from World Development Indicators 2019, World Bank

With the liberal trade regimes followed by the Chinese economy, the maximum FDI flows have been flowing to China as compared to other developing countries of the world. It remains the leader in getting highest FDI inflows since 1985 to 2017. But, if the trend of only last decade is seen, the growth made by the Indian economy in terms of FDI inflows is also noticeable i.e. 58.42% which is the maximum among other developing countries.

ANALYSIS OF STRENGTHS AND WEAKNESSES OF INDIA AND CHINA INDIVIDUALLY

A comparative analysis of India and China is presented below which addresses the question 'why should an MNC make FDI in India and China?' This analysis will help to understand the future challenges posed in front of these two countries individually.

Table 2: Strengths and Weaknesses Analysis of India

Strengths	Weaknesses

- Very huge market size in terms of population base of 1.34 billion people - High prospects of growth potential in terms of rapid increase in GDP growth rates - Fast improvements in real production output measure by Industrial Production Index - Three tiered democratic system that ensures a stable political environment - Well developed and an independent judicial system - Huge repository of natural resources and raw material - Availability of educated workforce at all levels - Large variety of consumers as takers in the market of manufactured goods and services - Proximity to manufacturing sites, easy access to suppliers and less development costs	- High levels of corruption - Undue political and bureaucratic pressures - Full or partial restriction on FDI in some sectors like agriculture, railways, power generation & distribution (though it is gradually getting privatized now), life and medical insurance (it is also opening up slowly), manufacturing of arms, explosives, atomic energy and aerospace - Weak infrastructure facilities along with inadequate security and safety in certain areas - World's most complex and stringent labour regulations leading to increase in net workers' remittances - Root level problems of unemployment, poverty and inequality of income leading to low purchasing power in hands of public at large

Table 3: Strengths and Weaknesses Analysis of China

Strengths	Weaknesses
- Largest market size in the world with 1.39 billion population - 2nd largest GDP level in the world showing huge growth prospects and market potential - Very high gross capital formation rate - Sound and well managed international liquidity - Very less risk of ethnic tensions and internal conflicts - Strong law and order mechanism - Stable government - Conducive environment measured by sound socio- economic conditions - Relatively lower labour cost - Development of new provinces like Sichuan offering new opportunities	- Ever changing legal context - Bureaucratic hassles and complexities - Lack of transparency in transactions - High corruption levels at all levels - Weak intellectual property rights protection - No opportunities for FDI in some sectors where monopoly exists like weapons, telecommunications, energy, environment, high technology, water supply, electricity, distribution services - Very rigid cultural practices- difficult for foreign MNCs to adopt and practice

The above analysis will enable the policy makers across the world to understand and determine the key drivers of FDI flows to India and China and also motivate other nations that do not fall in the category of emerging markets to identify the areas of improvement and try to move up to the category of emerging economies.

This study is also very significant for the literature because there are many researchers who have contributed to the determination of quantitative factors

driving FDI inflows in a country but there are not much studies carried out to find out whether FDI inflows are also affected by qualitative factors, especially in the context of Asian countries like India and China.

LITERATURE REVIEW

By providing technical knowhow, capital and access to diverse markets for production of goods and services, FDI is assumed to bring about economic growth in the developing countries. However, host countries find it challenging to attract FDI as there is a need to identify the factors impacting FDI inflows and then make the necessary improvements, if any, on those factors that are the key drivers of FDI.

There are several studies which have analyzed the determinants of FDI for individual countries or groups of countries that are part of developing markets. A brief summary of such studies is presented in this section:

2.1 Studies in the context of group of developing countries:

A study based on institutional determinants by Giuseppina Talamo (2011) revealed corporate governance and institutional quality as the most important factor of FDI. Belay Seyoum and Terrell G. Manyak (2009) concluded that public and private transparency can act as the strong reason for rising FDI inflows in developing countries. In another study on developing countries, Matthias Busse and Carsten Hefeker (2005) showed that a stable government, absence of internal conflict and ethnic tensions, basic democratic rights and a proper law and order mechanism leads to better FDI inflows. Alvin G. Wint and Densil A. Williams (2002) also supported stable government policies as a reason for having more FDI flows into the host country. Koji Miyamoto (2003) highlighted that an economy having a focused approach for human capital formation (i.e. by making both public and private investments on improvising the standard of living, education and health of man power) attracts more MNCs to invest their capital for long run in the form of FDI. Another perspective for attracting more FDI inflows in the host country was presented by Keith E. Maskus (2000) who stressed on the protection of intellectual property rights (IPRs) of the MNCs bringing not just capital but also production technologies to the host country. He emphasized on the need of adhering to various multilateral agreements (like Multilateral Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)) to significantly strengthen the IPR regime in the host country.

2.2 Studies in the context of specific developing countries:

A study by Yi Hu (2007) concluded that higher literacy and education rates in China attract more FDI inflows. In the context of Pakistan, A. S. Rehman (2009) highlighted the importance of political stability and availability of energy to the MNEs to invite them to invest their capital for a long run. In a research on African countries, Jacob W. Musila and Simon P. Sigue (2006) emphasized on bringing

economic reforms and policy changes in the host country so as to be a favorite destination of investment by MNCs. In addition to this, Elizabeth Asiedu (2001) said that by providing better infrastructural facilities and following liberalized trade regimes, host countries like Africa may attract more FDI inflows. Almost similar conclusions were drawn in the context of Russia by various researchers. In a study conducted by Jones et al. (2000), national infrastructure facilities and transparent government policies were cited as the most crucial determinants of attracting more FDI inflows. Another study by Andrey Popovich (2007) mentioned political risk as the most important deterrent towards bringing FDI inflows. Bergsman et al. (1999) in an earlier study on Russia also focused on having a more modern approach towards FDI, i.e. by following liberalized trade regimes to the maximum extent possible. The overall environment of a host country in terms of stable government policies, transparent law and order mechanism, better infrastructural facilities (e.g. energy, transportation, etc.) and a clear focus on education and health sectors makes a difference in bringing these developing countries on the top list of destinations attracting maximum FDI inflows.

From the above review of literature regarding determinants of FDI it has been observed that researchers agreed about the impact of many determinants on FDI but there is lack of uniformity of the opinion regarding the influence of some determinants like country risk ratings have not been researched much in the past and thus, this necessitates reinvestigation of all these factors influencing FDI inflows in the specific context of India and China.

3. RESEARCH METHODOLOGY

3.1 Objective

The objective of this study is to determine the most significant institutional determinants impacting FDI inflows in India and China.

3.2 Period of the study

The study has been conducted on annual data of ten years period from 2007 to 2017. This is because of the paucity of data for all fifteen determinants chosen for the study; these have been shortlisted as per the uniform availability of data points.

3.3 Sources of data

The required dataset for institutional determinants has been obtained from World Development Indicators published by the World Bank and Country's Risk Ratings published by PRS Group, USA.

3.4 Potential Variables Used in the Study

On the basis of the literature reviewed in the previous section, a set of potential

variables have been chosen that may have an impact on the FDI flows into a country. The dependent variable in this study is the FDI inflow in US billion dollars and the independent variables that are expected to determine FDI inflows are carefully chosen on the basis of availability of data for the selected period. The dataset consists of annual dataset from 2007-2017 for India and China.

Table 4: Independent Variables used in the study and their measurement

Variable Symbol	Variable Name	Measurement
X1	Corruption	# Risk rating based on assessment of corruption within the political system. Maximum points: 6, Minimum Points: 0
X2	Ethnic Tensions	#Risk rating based on assessment of the degree of tension within a country attributable to racial, nationality, or language divisions. Maximum points: 6, Minimum Points: 0
X3	Logistics performance index: Ability to track and trace consignments	*Risk rating based on the most important export and import markets of the respondent's country, and neighboring countries that connect them with international markets. Maximum Points: 5 (very high), Minimum Points: 1 (very low)
X4	Gender parity index (GPI): School enrollment, tertiary (gross)	*Gender parity index for gross enrollment ratio in tertiary education is the ratio of women to men enrolled at tertiary level in public and private schools.
X5	Bureaucracy quality	#Risk rating based on sub components: the institutional strength and quality of the bureaucracy. Maximum points: 4, Minimum Points: 0
X6	External conflict	#Risk rating based on sub components: War, Cross-Border Conflict and Foreign Pressures. Maximum points: 12, Minimum Points: 0
X7	Government Stability	#Risk rating based on sub components: Government Unity, Legislative Strength and Popular Support. Maximum points: 12, Minimum Points: 0
X8	Internal conflict	#Risk rating based on sub components: Civil War/Coup Threat, Terrorism/Political Violence and Civil Disorder. Maximum points: 12, Minimum Points: 0
X9	Law and Order	#Risk rating based on sub components: strength and impartiality of the legal system and popular observance of the law. Maximum points: 6, Minimum Points: 0
X10	Military in Politics	# Risk rating based on assessment of threat of military takeover. Maximum points: 6, Minimum Points: 0
X11	Religious Tensions	# Risk rating based on assessment of threat by a single religious group that seeks to replace civil law by religious law. Maximum points: 6, Minimum Points: 0

Variable Symbol	Variable Name	Measurement
X12	Socioeconomic Conditions	#Risk rating based on sub components: Unemployment, Consumer Confidence and Poverty. Maximum points: 12, Minimum Points: 0
X13	Business Extent of disclosure index	*Risk ratings based on the extent to which investors are protected through disclosure of ownership and financial information. Maximum points: 10 (more disclosure), Minimum points: 0 (less disclosure)
X14	Logistics performance index: Overall	*Risk ratings based on efficiency of customs clearance process, quality of trade and transport- related infrastructure, ease of arranging competitively priced shipments, and frequency with which shipments reach the consignee within the scheduled time, etc. Maximum points: 5 (better performance), Minimum points: 1 (worst performance).
X15	Quality of port infrastructure	*Risk ratings based on business executives' perception of their country's port facilities, i.e. how accessible are thee port facilities. Maximum points: 7 (well developed), Minimum points: 1 (extremely underdeveloped).

Notes: 1. Own compilation based on extensive literature review.

2. #Extracted from the ICRG Methodology provided on http://www.prsgroup.com/ICRG_methodology.aspx where points are assigned by ICRG, PRS Group, USA editors on the basis of a series of pre-set questions for each risk component (accessed on 18-05-2019). Maximum points of each risk ratings equates to very low risk whereas minimum points means very high risk.

3. *Extracted from World Development Indicators published by World Bank where points are assigned by various compiling agencies on the basis of rounds of surveys conducted with targeted respondents (accessed on 03-06-2019). Maximum points and minimum points assigned are explained in the table above.

DATA, METHODOLOGICAL FRAMEWORK AND MODELING

As part of preliminary investigation, the descriptive statistics of the variables used in the study have been presented in Table 5 below.

Table 5: Descriptive Statistics of independent variables in the study (in US billion $)

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
X1	20	2.3670	0.2490	1.5000	2.5000
X2	20	3.2611	0.8240	2.5000	4.5000
X3	20	3.2485	0.2223	2.8200	3.5500
X4	20	1.0191	0.0446	0.9823	1.1191
X5	20	2.5000	0.5129	2.0000	3.0000
X6	20	9.8048	0.2447	9.0000	10.0000
X7	20	9.4217	1.3439	7.0000	11.0000
X8	20	8.6382	1.3890	6.5000	10.5000

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
X9	20	4.2500	0.2564	4.0000	4.5000
X10	20	3.5000	0.5129	3.0000	4.0000
X11	20	3.7500	1.2824	2.5000	5.0000
X12	20	6.5296	1.6892	4.5000	9.0000
X13	20	8.1000	1.9708	6.0000	10.0000
X14	20	3.1705	0.3285	2.8700	3.7100
X15	20	4.3731	0.1755	3.9799	4.6000

Note: Own compilation based on the computations done on STATA (Version 12.0)

Table 5 above suggests that all the selected variables in the study have equal number of 20 observations. This means that the panel is balanced with no missing observations. The results of the table also suggest that Country's risk rating on threat of external conflict (X6) has the highest mean value of 9.8048. However the standard deviation of Country's risk rating on Business Extent of disclosure index (X13) is the highest among the given variables i.e. 1.9704.

4.1 Checking for Stationarity

In time series data it is very important to check whether the data is stationary or contains unit root i.e. it is stochastic. The idea behind this is to verify whether the data is stable in the long run or is it following some random walk. Also, in this case the stationarity test will be performed only on the net FDI inflows because the other dependent variables are qualitative. Qualitative data loses its significance if it is made stationary.

To conduct this test for stationarity, Levin-Lin-Chu unit-root test is used. If the p-value is less than 0.05, we reject the null hypothesis i.e. panel contains unit root. In this case p-value came out to be more than 0.05 and thus null hypothesis could not be rejected implying that data contains unit root.

In order to solve the problem of unit root the 'y' series is converted into 'y growth' series by taking natural log and then taking the first difference. After checking the data again for stationarity by using the Levin-Lin Chu (2002) test, the problem of unit root was removed.

4.2 Checking for multicollinearity

The OLS methodology allows us to check for the existence of multicollinearity in the model through the Variance Inflation Factor (VIF). The literature shows that if the mean VIF is greater than 5, the model suffers from the problem of multicollinearity (Judge et al., 1982). By calculating the VIF for all the fifteen variables under study the mean VIF came out to be higher than 5 as a result the variables were dropped and then checked again for mean VIF. The results of the alternative

that is the best explanatory of the changes in FDI inflows are presented in Table 6 below:

Table 6: Variance Inflation Factor for dependent variables

Variable	VIF	1/VIF
X2	**4.4200**	**0.2261**
X3	**3.5900**	**0.2788**
X1	**1.4600**	**0.6832**
X4	**1.3200**	**0.7578**
Mean VIF	**2.7000**	

Note: Own compilation based on the computations done on STATA (Version 12.0)

In Table 6 above, the mean VIF value as well as individual VIF is less than 5, thus no problem of multicollinearity is seen.

4.3 After testing the above assumptions, the general specification of the remaining parameters (dependent and independent variables) of the model in this study is as follows:

$$Y_{it} = \alpha + \beta_1 X1_{it} + \beta_2 X2_{it} + \beta_3 X3_{it} + \beta_4 X4_{it} + \mu_{it}$$

Here, Y_{it} refers to the log of net inflows of FDI in the current USD for a country i (both India and China) at time period t. This is the dependent variable.

The right hand side of the specification model includes all the independent variables which are defined as follows:

$X1_{it}$ is the country's risk rating on corruption for country i at time period t.

$X2_{it}$ is the country's risk rating on ethnic tensions for a country i at time period t.

$X3_{it}$ is the country's risk rating on logistics performance index i.e. the score of the country on its ability to track and trace consignments for a country i at time period t.

$X4_{it}$ is the country's risk rating on gender parity index for school enrollment at the primary level. GPI is the ratio of girls to boys enrolled at the primary level in public and private schools for a country i at time period t.

μ_{it} is the stochastic disturbance term.

4.4 Statistical techniques used

In order to evaluate the potential determinants of FDI inflows for India and China as a group, panel data analysis (Balestra, 1992) has been applied. In this study along with the common constant model (OLS regression), both fixed effects (FE) model and random effects (RE) model have also been used for exploring the key institutional determinants of FDI inflows into India and China.

a) The Common Constant Model (also called as pooled OLS method): Here the null hypothesis is that there is no difference between the constants (homogeneity), and thus, the pooled OLS method is applicable.

$$H_0 = \alpha_1=\alpha_2=\alpha_N \quad (2)$$

However, this case is practically not possible and has its own limitations. Thus it is important to include the fixed and random effects in the method for estimations.

b) Fixed Effects (FE) Model: This model assumes that the constant is fixed over time for each group and that every group has a different constant

FE model can be explained as under:

$$y_{it} = \alpha_i + \sum_{k=1}^{k} X_{itk}\beta_k + \varepsilon_{it} \quad (3)$$

where

i = 1,2,…..,N

t = 1,2,…..,T

where Y_{it} represents the value of the dependent variable, that is, FDI inflows in cross-section *i* (two countries in our case); *T* is the length of time series, that is, 2007-2017; *k* is the number of independent variables explaining the dependent variable. The term $_i$ denotes unobserved country-specific effects that are assumed to be fixed over time and different across country *i*. X_{it} and represent the vectors of explanatory variables and their parameters respectively. The subscript *i* indicates individual countries, while *t* shows different time periods. represents the vector of the error component which is assumed to be independently distributed across *i* and over *t* with mean zero and variance ^{2}.

(c) Random Effects (RE) Model*:* This model of estimation assumes the constants for each section as random parameters rather than fixed. Hence, the constants tend to vary and do not remain fixed over time. In this case the model is defined as:

Where,

i = 1, 2,…..,N

t = 1, 2,…..,T

 = + , t= 1,. . . . ,T are the composite errors

For each t, is the sum of the unobserved effect and an idiosyncratic error (Wooldridge (2010)). are assumed to be independently distributed across *i,* with mean zero and variance and uncorrelated with The error term is assumed to be

independently distributed across *i* and over *t* with mean zero and variance σ^2.

Finally, it can be seen that in the panel data analysis, the fixed effects model assumes that each country differs in its intercept term whereas the random effects model assumes that each country differs in its error term.

4.5 Hausman Specification Test

Hausman specification test (1978) must be used in order to find out the appropriate panel data model. Therefore, in such case following hypotheses are tested:

Null Hypothesis: H_0: Cov (αi, X*it*) = 0, that is, random effect model is suitable, if null hypothesis is accepted.

Alternate Hypothesis: H_a: Cov (αi, X*it*) $\neq$ 0, that is, fixed effect model is suitable, if alternate hypothesis is accepted.

If $p < 0.05$ ⇒ FE is suitable

If $p > 0.05$ ⇒ RE is suitable

Where p refers to the probability value of the test statistic. If p value is larger than level of significance, then the null hypothesis can not be rejected and therefore RE model is a more suitable model but if the p value is less than level of significance then the null hypothesis is rejected and FE model becomes more appropriate model to use.

After applying the three estimated models i.e. OLS, FE and RE in the panel data analysis, we need to find out which model out of the three is a model of best fit. This is done by applying various statistical tests.

First, the study checks which model among the OLS regression and FE should be used. To check this, the standard F-test can be applied to see whether the model has fixed effects (i.e., different constants for each group). Second, we compare the FE model with the RE model to find out which of the two should be used. This can be done by using Hausman specification test. Third, to choose between the common constant model (OLS regression) and the RE model, Breusch– Pagan Lagrange multiplier (LM) test (1980) is computed.

4.6 The following hypotheses have been formulated for the independent variables:

H_1: Country's risk rating on corruption is not significant in determining FDI inflows of country i at time t.

H_2: Country's risk rating on ethnic tensions is not significant in determining FDI inflows of country i at time t.

H_3: Country's risk rating on logistics performance index is not significant in determining FDI inflows of country i at time t.

H_4: Country's risk rating on gender parity index for school enrollment at the primary level is not significant in determining FDI inflows of country i at time t.

EMPIRICAL RESULTS AND DISCUSSIONS

Tables 7 below shows the correlation matrix of the variables chosen for study:

Table 7: Correlation Matrix of the Selected Variables in the Study

	Y	X1	X2	X3	X4
Y	1.0000				
X1	-0.0884	1.0000			
X2	-0.1225	-0.5522	1.0000		
X3	0.0803	0.4217	-0.8471	1.0000	
X4	-0.1935	-0.3231	0.4868	-0.4295	1.0000

Table 7 shows the direction in which FDI inflows move in relation to the selected determinants. From the above table it can be seen that only variable X3 (logistics performance index: ability to track and trace consignments) is showing a positive sign meaning a direct relationship with the FDI inflows. All the other variables X1 (country's score on corruption), X2 (country's score on ethnic tension) and X4 (gender parity index for school enrollment at the primary level) are negatively correlated with FDI inflows, i.e. an increase in the country's score on any of these variables will adversely affect the FDI inflows for that country. Further, the results in Table 7 display that none of the independent variables are found to be correlated with each other, hence, solving the multicollinearity problem in the model.

In order to capture the distribution of FDI across India and China over a period of 10 years the estimates were generated using the following panel data techniques (1) Common Constant (OLS regression) model (2) FE model, and (3) RE model. The estimation results of all the three models are explained in Table 8 below:

Table 8: Determinants of FDI Inflows as per the Three Models of Panel Data Analysis

Dependent Variable: FDI Inflows			
Independent Variables	**Common Constant Model (OLS)**	**Fixed Effects Model (FE)**	**Random Effects Model (RE)**
X1	-6.0894 (-4.41)	-0.35834 (-0.85)	-0.3369 [-0.83]
X2	0.5131 (2.00)	-0.0233 (-0.06)	-0.1142 [-0.54]
X3	-7.5022 (-3.13)	-0.3932 (-0.41)	-0.2055 [-0.29]

Dependent Variable: FDI Inflows			
Independent Variables	**Common Constant Model (OLS)**	**Fixed Effects Model (FE)**	**Random Effects Model (RE)**
X4	6.2091 (1.76)	-0.0881 (-0.30)	-1.4804 [-0.69]
Mean VIF	2.95	-	-
F-Test	-	0.26*	-
Wald Chi-square	-	-	5.05
R^2 within	-	0.0699	0.0638
R^2 between	-	1.0000	1.0000
R^2 overall	-	0.0079	0.0833
Mean VIF		2.17	
Hausman Test (p-value)		0.10 (0.9989)	
Breusch–Pagan Lagrange multiplier (LM) Test: Var(u) = 0	-	-	Chi-sqaure= 0.00 Prob. > Chi-square = 1.0000

Parentheses () and [] show the *t*-value and *z*-statistics respectively. * denotes the significance at 5 percent.

From Table 8 above, it can be seen that the first column (common constant model) shows the estimation results for the regression equation. However the OLS methodology is only useful if the dataset is assumed to be homogeneous, that is, there is no difference between the estimated cross sections (India and China in our case). Therefore, this model is quite restrictive, however it allows us to check for the existence of multicollinearity in the model through the Variance Inflation Factor (VIF). In Table 8 above the mean VIF from OLS is found to be 2.95 which imply that there is no indication of multicollinearity problem in the model considered. Also the F-test indicates that the null hypothesis (OLS model) is rejected and therefore FE model is preferred to common constant (OLS) model.

The third and fourth columns of the table respectively show the results of the FE and RE model. The next choice is between the FE and RE model. In order to select one of the two models, Hausman specification test was conducted. The test gave a chi-square value of 0.10 which was not significant at 5% significance level and therefore RE model is chosen over the FE model.

For comparing the RE model with the common constant model, Breusch– Pa-

gan Lagrange multiplier test was conducted which revealed that the Prob > χ^2 was more than 0.05 and hence we failed to reject the null hypothesis that the variances across the two countries are same due to which RE model was not appropriate and OLS model should be used. But we are still going to use the RE model instead of the OLS model because of two reasons. First, the results of the OLS model were found to be similar to that of the RE model and second because the Hausman specification test also favored the RE model in comparison with FE model. Moreover the common constant model assumes homogeneity in the datasets, which is practically not possible. Therefore, it was decided to drop the common constant model and not to report its results any further in the study.

5.1 Residual Diagnostic Testing

Modified Wald test for group-wise heteroskedasticity for both the FE and RE models was testes which has a chi-square value of 5.05 which is not significant at 5 percent significance level. Thus, we cannot reject the null hypothesis (homoskedasticity or constant variance) and therefore conclude that the models are not suffering from the problem of heteroskedasticity.

In order to test the cross-sectional dependence/ contemporaneous correlation among the residuals, Breusch–Pagan Lagrange multiplier test of independence was used for the FE and RE models which showed that the chi – square distribution is 0.024 with a p value of 0.8758 so the chi-square distribution is not significant at 5 percent significance level and therefore we cannot reject the null hypothesis that is, there is no cross-sectional dependence or residuals across countries are not correlated.

Lastly, the test for serial correlation is conducted where the F-statistic comes out to be 0.231 which is again not significant at 0.05 level so we cannot reject the null hypothesis and conclude that the residuals do not have first – order autocorrelation.

From the above results we can see that although both the models do not suffer from the problem of heteroskedasticity, neither do they violate the assumption of no autocorrelation among the residuals but still in order to derive the model of best fit the robust models of FE and RE will be used. For FE and RE models, the cluster option in STATA can be applied along with the regression command to produce robust standard error estimates for linear panel models. The results of the modified model are presented in the table below.

Table 9: Determinants of FDI Inflows as per both the Modified Models of Panel Data Analysis

Dependent Variable: FDI Inflows		
Independent Variables	**Fixed Effects Model–Cluster Option (FE)**	**Random Effects Model–Cluster Option (RE)**

Intercept	3.2319 (0.74)	3.47875 [0.74]
X1	-0.3583 (-1.15)	-0.3369 [-5.15]*
X2	-0.0233 (-0.06)	-0.1142 [-0.39]
X3	-0.3932 (-0.31)	-0.2056 [-0.17]
X4	-0.8812 (-0.32)	-1.4804 [-5.46]*
R^2 within	-	0.0638
R^2 between	-	1.0000
R^2 overall	-	0.0833

Parentheses () and [] show the *t*-value and *z*-statistics, respectively. * denotes significance at 5 percent level.

The empirical results of the RE model as presented in Table 9 above shows that country's risk rating on corruption (X1) is a significant determinant of FDI inflows in India and China and it is negatively affecting the FDI inflows. It implies that as the scores on corruption for the countries go up, the resultant effect on FDI inflows is negative because MNCs or any individual would not like to invest in a country with high levels of corruption because it has a negative impact on the nations' economic growth. This might act as a demotivating factor for the investors while analyzing the alternative of making long term investments in Asian countries like India and China.

Country's risk rating on gender parity index for school enrollment at the primary level (X4) is also significant in determining FDI inflows. However the negative coefficient shows the inverse relationship between the variable and FDI inflows. This might be because although in recent years the ratings of both the countries have gone up with regards to GPI for school enrollment which means that the countries are performing good on this front but there is still a lot of scope for improvement. The increase in ratings is not sufficient to attract FDI towards these countries. Both these determinants are statistically significant at 5 percent level of significance.

Thus this study shows that these two variables are the most crucial factors for attracting FDI towards India and China. Besides, the result also shows some other variables like the country's risk rating on ethnic tensions and the country's risk rating on logistics performance index for the ability to track and trace consignments with insignificant coefficient values implying that these are not very relevant for India and China for attracting more FDI inflows.

Finally, it can be asserted from the findings that the determinants are behaving in the same direction as expected in other developing countries of the world and are extremely useful (95 percent confidence level) in attracting FDI inflows in India and China.

The theories existing in the international business environment that determine the movement of FDI flows to a specific country support the findings of the study.

CONCLUSION AND RECOMMENDATIONS

The findings indicate that the Governments of India and China must put efforts in reducing the level of corruption and improving the ratio of females to males getting enrolled in school at the primary level in order to attract more FDI. Also both the countries should put individual efforts also to have more integration among each other. Both these countries are classified as emerging economies and hence there is a lot of scope for improvement on various fronts in order to drive FDIs to various sectors. Poor institutional quality is the biggest challenge for these countries.

In case of China, besides the factors identified in the study, other factors like friendly business climate, structural changes, better infrastructure facilities to promote exports, strategic policy initiatives of providing economic freedom, and flexible laws can also be the driving forces for attracting FDI. Similarly while India has risen due to its human capital, size of the market, market growth rate, and stability of political systems, apart from the factors identified in the study, to enhance FDI inflows, the policy makers need to ensure more economic and political stability, better infrastructure facility, a peaceful environment having a proper law and order mechanism, and reduce the external liabilities.

All this analysis is conducted with an intention to help the policy makers in these countries who can make strategic decision making about those specific areas of concern only where their country is lagging (in terms of institutional quality) and channelize the efforts of their Governments to turn this dream into reality-the dream to become supreme powers in the world economy by 2050.

Based on the strengths and weaknesses analyses of both the countries and other than the above two determinants affecting both India and China commonly, following points are also recommended to both the Governments:

(a) For India:

i. While maintaining its service-led growth model, India should also diversify its growth model for manufacturing.

ii. The government should allocate more capital in the budget for the implementation of programs for improving physical infrastructure.

iii. The agriculture sector is to be equipped with all the latest developments for which technological innovations should be made accessible to agriculturists easily.

iv. The Government should make provisions to render essential public services such as education and health to maximum parts of the population for the overall economic development of the nation.

(b) For China

Though being one of the top most destinations in the world (it has highest FDI inflows, highest GDP growth rates, highest gross capital formation, and highest international liquidity, low compensation of workers, least risk of ethnic tensions, internal conflicts, most stable government, a proper law and order mechanism in place and an overall congenial working environment measured by socio- economic conditions), China has all the advantages to relish the success over the next few years too. However, to compete with its counterparts, following recommendations are made to the Chinese Government:

i. Improper law and order mechanism within the country in terms of partial judicial system or rising crime rate has led to decline in FDI inflows. Therefore, to protect the rights of investors, Government should take proactive steps to avoid any such situation.

ii. Financial sector reforms are needed to improve the intermediation of China's large private savings.

iii. The government needs to rise its social spending in the areas of education, healthcare and pension, which will boost consumption over time.

iv. There is also need to provide more support to rural areas and less-developed regions of the country.

References

Asiedu, E. (2001), 'On the Determinants of Foreign Direct Investment to Developing Countries: Is Africa Different?' [*Available at:* SSRN: http://dx.doi.org/10.2139/ssrn.280062] (accessed 26 June 2018).

Balestra, P. (1992), 'Introduction to Linear Models for Panel Data', In *The Econometrics of Panel Data*. Springer: Netherlands, pp. 21-29.

Bergsman, J., Broadman, H. G. and Drebentsov, V. (1999). Improving Russia's Foreign Direct Investment Policy Regime. In Broadman, H. G. (Ed.), *Russian Trade Policy Reform for WTO Accession*. Washington, DC: The World Bank

Breusch, T. S., and Pagan, A. R. (1980), 'The LM Test and Its Applications to Model Specification in Econometrics', *Review of Economic Studies,* Vol. 47, pp. 239–254.

Busse, M. and Hefeker, C. (2005), 'Political Risk, Institutions and Foreign Direct Investment'. HWWA Discussion Paper No. 315 [*Available at SSRN:* http://dx.doi.org/10.2139/ssrn.704283] (accessed 26 June 2018).

Hausman, J. A. (1978), 'Specification Tests in Econometrics', *Econometrica*, Vol. 46, pp. 1251- 1271.

Hu, Y. (2007), 'Foreign Direct Investment in China and India: Development Experiences and Determinants in a Comparative Perspective', Dissertation in partial fulfillment of the requirements of the degree of M.Sc. in China in Comparative Perspectives (Anthropology Department).

International Country Risk Guide (ICRG) Methodology. [*Available at:* http://www.prsgroup.com/ICRG_methodology.aspx] (accessed 18 May 2019).

Jones, A., Fallon, G. and Golov, R. (2000), 'Obstacles to Foreign Direct Investment in Russia', European Business Review, Vol. 12, No. 4, pp.187-197. [*Available at:* https://doi.org/10.1108/09555340010336871]

Judge, G. G., R. C. Hill, W. E. Griffiths, H. Lütkepohl, and T.C. Lee (1982). Introduction to the Theory and Practice of Econometrics. New York: John Wiley & Sons, 839 pages.

Levin, A., Lin, C.- F. and Chu., C.- S. J. (2002), 'Unit Root Tests in Panel Data: Asymptotic and Finite-Sample Properties', *Journal of Econometrics*, Vol. 108, pp. 1–24.

Maskus, K. E. (2000), 'Intellectual Property Rights and Foreign Direct Investment', Centre for International Economic Studies, Working Paper No. 22. [*Available at:* SSRN: http://dx.doi.org/10.2139/ssrn.231122] (accessed 26 June 2018).

Miyamoto, K. (2003), 'Human Capital Formation and Foreign Direct Investment in Developing Countries', Organisation for Economic Co-operation and Development (OECD) Paper No. 211. [*Available at SSRN:* http://dx.doi.org/10.2139/ssrn.668505] (accessed 26 June 2018).

Musila, J. W. and Sigue, S. P. (2006), 'Accelerating Foreign Direct Investment Flow to Africa: From Policy Statements to Successful Strategies', *Managerial Finance*, Vol. 32, No. 7, pp. 577 – 593.

Popovich, A. (2007), 'Investing in Emerging Markets: finding out how Political Risk influences FDI in Russia' [*Available at SSRN:* http://dx.doi.org/10.2139/ssrn.996414] (accessed 26 June 2018).

Rehman, A. S., (2009), 'Studying Determinants of FDI in Pakistan', In *Proceedings of 2nd International Conference on Business Management*, pp. 1-17.

Seyoum, B. and Manyak, T. G. (2009), 'The Impact of Public and Private Sector Transparency on Foreign Direct Investment in Developing Countries', *Critical Perspectives on International Business*, Vol. 5, No. 3, pp. 187 – 206.

Talamo, G. (2011), 'Corporate Governance and Capital Flows', *Corporate Governance*, Vol. 11, No. 3, pp. 228 – 243.

Wint, A. G. and Williams, D. A. (2002), 'Attracting FDI to Developing Countries: A Changing Role for Government?', *International Journal of Public Sector Management*, Vol. 15, No. 5, pp. 361 – 374.

Wooldridge, J. M. (2010), 'Econometric Analysis of Cross Section and Panel Data', MIT Press, pp. 257-265.

World Development Indicators 2019 Database, World Bank [*Available at: http:*//data.worldbank.org/data-catalog/world-development-indicators] (accessed 03 June 2019).